

Orthoclase becomes a clear glass filled with bubbles :— at a lower temperature beryl behaves in the same way.

Topaz whitens to a milky glass—apparently decomposing, throwing out filmy threads of clear glass and bubbles of glass which break, liberating a gas (fluorine?) which, attacking the white-hot platinum, causes rings of colour to appear round the specimen. I have now been using the apparatus for nearly a month, and in its earliest days it led me right in the diagnosis of a microscopical mineral, iolite, not before found in our Irish granite, I think. The unlooked-for characters of the mineral, coupled with the extreme minuteness of the crystals, led me previously astray, until my melometer fixed its fusibility for me as far above the suspected bodies.

Carbon slips were at first used, as I was unaware of the capabilities of platinum.

A form of the apparatus adapted, at Prof. Fitzgerald's suggestion, to fit into the lantern for projection on the screen has been made for me by Yeates. In this form the heated conductor passes both below and above the specimen, which is regarded from a horizontal direction.

J. JOLY

Physical Laboratory, Trinity College, Dublin,
November 1

NOTES

OUR readers will hear with regret that Prof. Huxley has placed in the hands of the Council of the Royal Society his resignation of the office of President, and that the Council have felt it their duty to accept that resignation. It would appear that Prof. Huxley had wished to resign so long ago as November last, when he had decided to winter abroad, and again, last summer, he definitely placed his resignation in the hands of the Council. On both these former occasions Prof. Huxley was induced to continue in office, in the hopes that he would soon regain complete health. On the present occasion we gather that the resignation was accepted, because, though Prof. Huxley is rapidly improving in health, the cares of the presidential chair seemed likely to prove a hindrance to his complete recovery being so rapid as could be desired. We feel sure that the whole scientific world will share the regret of the Council of the Royal Society at the necessity of such a step, but we also feel that every one must recognise the wisdom of the decision. We may add that every one hopes that freedom from the responsibilities of office may soon convert the marked improvement in Prof. Huxley's health, visible to all his friends, into complete and perfect restoration.

WE understand that Prof. Stokes has consented to allow himself to be nominated as Prof. Huxley's successor in the presidential chair. We believe that this choice of the Council will give universal satisfaction to the Fellows of the Society; while it makes Prof. Stokes doubly the successor of Newton, it does honour to the Society.

A CONSIDERABLE portion of the "Zoological Record" for 1884 has already been issued to subscribers; the Reports on Coleoptera, Lepidoptera, and Hymenoptera, by Mr. W. F. Kirby, were issued in September, and those on Reptiles, Fishes, Mollusca, Tunicata, Polyzoa, and Brachiopoda last week. The remaining parts are in a very forward state, Mr. W. L. Sclater, B.A., having undertaken the Mammalia in the place of Dr. Murie.

THE French Government has just created a certain number of travelling-juries. This is a modified form of an institution established by the first Republic. In the organic law of the Institut it was ordained that the Institut was to select yearly ten citizens to travel abroad and collect information useful to science, commerce, and agriculture. These scientific travellers will not be

appointed by the Academy of Sciences or the whole Institut, but by a special administrative commission on the basis of a competitive examination.

WHILE so much public attention is attracted by the second part of the Greville "Memoirs," it will interest our readers to learn that the acute and observant Clerk to the Council, who, on the whole, had a very low idea of the great men with whom he came in contact, possessed a great respect for the men of science of his generation. Under March 17, 1838, we find the following interesting entry ("Memoirs," vol. i. p. 78):—"Went to the Royal Institution last night in hopes of hearing Faraday lecture but the lecture was given by Mr. Pereira upon crystals, a subject of which he appeared to be master, to judge by his facility and fluency; but the whole of it was unintelligible to me. Met Dr. Buckland and talked to him for an hour, and he introduced me to Mr. Wheatstone, the inventor of the electric telegraph, of the progress of which he gave us an account. I wish I had turned my attention to these things and sought occupation and amusement in them long ago. I am satisfied that, apart from all considerations of utility, or even of profit, they afford a very pregnant source of pleasure and gratification. There is a cheerfulness, an activity, an appearance of satisfaction in the conversation and demeanour of scientific men that conveys a lively notion of the *pleasure* they derive from their pursuits. I feel ashamed to go among such people when I compare their lives with my own, their knowledge with my ignorance, their brisk and active intellects with my dull and sluggish mind, become sluggish and feeble for want of exercise and care."

THE first volume of "Geology, Chemical, Physical, and Stratigraphical," by Prof. Joseph Prestwich, F.R.S., will be ready for publication immediately by the Clarendon Press. This work is a general treatise on Geology adapted both for elementary and advanced students. Vol. I. treats of questions in chemical and physical geology, and special attention is paid to such subjects, among others, as Hydro-Geology, the geological bearings of the recent deep-sea explorations, volcanic action, joints, mineral veins, the age of mountain ranges, and metamorphism. Vol. II., which is far advanced, treats of stratigraphy and palæontology, and touches upon various theoretical questions. The author advocates the *non-uniformitarian* views of geology. The book is copiously illustrated with woodcuts, maps, and plates.

FATHER DENZA, according to the *Times* Rome correspondent, writing from the Observatory of Moncalieri, gives interesting particulars of a remarkable shower of dust which fell in various parts of Italy in the night of October 14-15. This dust-shower accompanied the violent gale of wind which occurred at the time, and seems to have fallen thickest in places situated more or less in the latitude of Rome. Father Denza regards the dust as meteoric. Mr. Abercromby writes to the *Times* to point out that this is probably premature, if by meteoric Father Denza means the product of meteors. But is it not probable that by meteoric sand he simply means sand which falls as "a meteor" or meteorological phenomenon? As Mr. Abercromby points out, this dust probably came from the Sahara.

AN interesting series of papers, copiously illustrated by charts, and comparative tables, is appearing in *Naturen*, on the climate of Norway. The author, Dr. Hesselberg, enters fully into the various causes on which depend the great differences between the inland and littoral climates, and notes in detail the varying relations of temperature for each month in the interior, and on the coast. From these tables it would appear that while in Norway, generally, the five months, from November to March inclusive, exhibit a purely winter temperature, no single month

presents throughout a complete summer temperature. The remaining four months pass through the various stages of temperature between winter and summer. In the more northern and more elevated parts of the interior not a single month of the year is free from the risk of night-frost, while in such localities frost occurs on from 225 to 230 days in the year. On the coast-lands, on the other hand, the mean winter temperature is generally from 2° to 3° Cels. above the freezing point, and here the greatest cold occurs in February, while in the interior December and January are the coldest months.

WE learn, from a recent report by Herr Reusch, of the condition of the Bommelö gold-mines worked by Messrs. Oscar and Daw, that gold to the value of 8000 kroner has been obtained during the three months in which these works have been in operation. The writer believes the mines may be made remunerative, but only moderately so, and provided they are worked with care and economy, and he emphatically warns his countrymen not to waste time and money, as has frequently been done in Norway, in seeking for gold in localities where the existence of any appreciable quantity of quartz is not well attested beforehand. He, moreover, points out the fallacy of believing that any large proportion of the auriferous quartz deposits of Norway are capable of yielding more than the mere fragmentary traces which are so constantly met with. Quite recently, indeed, the presence of gold has been shown in new localities, Herr Hansen having obtained in the quartz at Haugesund a number of microscopically small granules of the precious metal with titanite iron, while at Mæland, in Bommelö, about four miles from the spot where the first finds were made, he extracted gold after crushing and washing the white quartz which occurs in large lumps, accumulated on a hillock about 5 feet high, by 36 in length, and 13 in breadth.

PÈRE DECHEVRENS, the head of the Zi-ka-wei Observatory near Shanghai, has published a pamphlet entitled, "The Meteorological Elements of the Climate of Shanghai: Twelve Years of Observations made at Zi-ka-wei by the Missionaries of the Society of Jesus." It is a series of tables containing "all the information that meteorology can supply concerning the climate of Shanghai." A complete meteorological period in China is said to be about eleven years, and consequently this pamphlet embraces one such period. The tables show maximum and minimum, mean and normal readings of the barometer and thermometer, intensity of solar radiation, relative and absolute humidity, nebulosity, rainfall, and direction and velocity of the wind for every month throughout the twelve years, conveniently tabulated for comparison. There is also a table of eight years' observations of ozone, and a special section is devoted to terrestrial magnetism. Explanations are given in most cases of the methods of taking the various observations, and the objects which they serve. The readings are all given according to English methods of computation; but for the convenience of those who are more familiar with the metric barometer scale and the centigrade degrees of temperature, tables for the conversion of the English into the Continental systems are given.

AMONGST the anthropological papers recently issued by the Smithsonian Institution, special interest attaches to the memoir by Lieut. C. E. Vreeland and Dr. J. F. Brandsford on the antiquities recently discovered on the Pantaleon estate, near Santa Lucia, Guatemala. This place, which lies about thirty miles north-west of Escuintla on the railway from San José to the city of Guatemala, was visited in 1884 by the authors for the purpose of photographing the objects, which had here been observed two years previously by Dr. Brandsford, and earlier by Dr. Habel. Several of the finest specimens had been removed to Berlin, where an account of them was published by Dr. Adolph Bastian. Those here

described and figured from the photographs form a group of remarkable sculptures, all of black basalt or hard lava mounted on a low wall round the fountain of the Pantaleon courtyard, and disposed in front of a grand central piece raised on a pedestal. This figure, which is in an excellent state of preservation, the nose alone being injured, is a new revelation in native American art, characterised by great strength and simplicity of outline. It is well formed, the lines simple and clearly cut, without a trace of the usual conventional style. Majesty is so plainly stamped on the countenance, that it was known to the Indians by the name of El Rey—the king. The brow, the eyes, and the nose, as far as can be judged, are in good shape and well proportioned; the mouth hard, the chin firm and full of character. Near it stands the head of an old person whose venerable appearance is heightened by the deep lines on brow and cheek. In contrast to this is another head of an old person, where calmness of expression is replaced by the inexpressible sadness of age with blindness. As in the case of some other figures, the eyes are here represented as hanging from the sockets, the balls resting on the cheeks. The chin and lower lip protrude, while the upper lip has fallen in as from the loss of teeth. To the long ears are appended large pear-shaped ornaments, and the turban-like headdress is surmounted with a little Tam O'Shanter cap. All the figures show real artistic skill, far beyond the elaborate but fantastic style of the conventional sculptures found at Copan and other parts of Central America.

A BORE-HOLE made about two years ago to a depth of 52 metres into the older Devonian strata near Burgbrohl on the Rhine, yields a large and steady supply of carbonic acid gas (with water) which is variously utilised. In a recent paper to the Niederrheinische Gesellschaft in Bonn, Herr Heusler says the normal quantity of gas amounts to about 2160 cubic metres in twenty-four hours. The supply having proved constant, a compressing apparatus was set up last autumn; the gas being taken directly over the bore hole. The present system produces per minute from 500 litres of gaseous C.O_2 , 1 litre of liquid, weighing 1 kilogram. As the liquefaction depends on the external air-temperature, and is impossible at a temperature over 30.9 C. (the critical point), it is necessary in high temperatures to cool the apparatus, and the water of the spring (which keeps at 12°) serves for this. The pressure employed ranges from about 50 to 70 atmospheres. The wrought-iron vessels for despatch of the liquid contained about 8 litres, or 8 kilograms, and are tested to about 250 atmospheres; they very rarely explode. The enormous expansion of carbonic acid with rise of temperature yields a pressure which is utilised, it is known, for compression of steel and other casts, and Messrs. Krupp at Essen have thus got, e.g. a pressure of 1200 atmospheres for a temperature rise of 200° C. Among other rises are pressure of beer, impregnation of natural water, apparatus for fire extinction, motor force for torpedoes, &c. Solid carbonic acid is to a large extent produced from liquid by opening the cock of the vessel into a canvass bag tied over the mouth.

IN his recent investigation of pile-dwellings of the Lake of Biemme, Dr. Studer has met with two extreme types of human skulls—the brachycephalic and the dolichocephalic; the former (at Schaffis and Lüscher) belonging to the pure Stone period, and the latter (found at Vinelz and Sutz) to the Bronze period. The facts point to an invasion by the bronze men, involving a complete transformation of the group of domestic animals; the horse appears for the first time, and new races of sheep and dogs drive out the old forms of the Stone period. The occurrence of mesocephalic, and even much shortened, skulls in the Bronze period shows that there was no extinction of the brachycephalic race, but that the two races mixed. This mixture of races in prehistoric times increases the difficulty of tracing back the skull-

forms of the present population. Dr. Studer suggests that the Rhaetian short-headed type may be referred to the old dwellers of the Stone period, in which case the prevalent dark hair, eyes, and skin of the present natives of Graubünden may recall the aspect of the older prehistoric race. There is also a large dark population about the lakes in Canton Berne.

M. VERNET has recently made a number of physiological observations on himself during eighteen ascents of high Alpine summits (between 1680 and 4638 metres in height). He finds that the strong muscular efforts made both in mounting and descending caused a rise of temperature of about 1.64° to 1.70° C. on an average; a rise in the pulse from about 75 to 83 in a minute, and an increase in the respiratory acts from about 21 to 25 in a minute. A few hours' rest after the effort ceased brought back the temperature to its normal value. Other muscular efforts, such as riding, wood-sawing or chopping, &c., had quite the same effect. The author's observations are detailed in the *Archives des Sciences*.

THE School of Anthropology, created a few years ago under the auspices of the city of Paris, has opened its 1885-86 session. The course of lectures delivered by M. de Mortillet on prehistoric anthropology will be illustrated for the first time by a series of projections. English anthropologists will learn with pleasure that M. Gabriel de Mortillet, who was one of the companions of Agassiz, has been elected representative of the Seine et Oise Department.

THE engineers of the French Service are establishing a telephonic communication between Paris and Rheims, 160 kilometres from Paris. The Paris terminus of this line will be the Exchange. A sum of one franc for each five minutes will be charged for conversation. As soon as this line is finished the work will begin of connecting Rouen with Paris (126 kilometres). Rouen has been already connected with Havre, 78 kilometres distant, by a telephonic line. Conversation between these two cities is very easily held. It is the success of this system which led to further extension on larger distances.

ON October 9, between 9 and 10 a.m., two severe shocks of earthquake were felt on the Lis Island, in the parish of Sorunda, in Sweden. In the school-house, while teaching was going on, two severe shocks were felt like two blows from an enormous hammer in the north-western corner of the building. In this corner the windows rattled, the floor swayed, and rumbling like that of distant thunder was heard. Simultaneously a great thunderstorm passed over the district, accompanied by heavy rain. It has, however, been ascertained beyond doubt that the shocks were not due to the former, as the shocks were felt by many persons out of doors. The earthquake went from west to east.

SINCE 1880, when diggings for amber were commenced under the Smaland Peninsula in East Prussia, the yield of the veins here has greatly increased. In 1864 the revenue was 1700*l.* against 25,000*l.* in 1883.

MR. WILLIAM CAMERON, F.G.S., the Singapore papers state, has been appointed *Honorary Explorer* and Geologist to the Straits Settlements. "*Honorary Explorer*" is a curious office, and we cannot recollect ever having heard of one before; but as Mr. Cameron, it is to be presumed, has accepted these two honorary offices, they must be of some assistance to him in his explorations in the Malay Peninsula. One so rarely hears of an *Honorary Colonial governor*, secretary, treasurer, or other official, that an "*Honorary Colonial Explorer*" is something of a *rara avis*, and as such deserves to be specially chronicled.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus* δ),

a Bonnet Monkey (*Macacus sinicus* f) from India, presented by Mr. C. E. McCheane; a Macaque Monkey (*Macacus cynomolgus* δ) from India, presented by Mr. C. Canfor; a Mexican Deer (*Cariacus mexicanus* δ) from Florida, presented by Mr. G. B. H. Marton; two Spotted-tailed Dasyures (*Dasyurus maculatus* δ f), three Short-headed Phalangiers (*Belideus breviceps* δ f) from South Australia, presented by Sir W. C. F. Robinson, K.C.M.G.; an Osprey (*Pandion halietus*), captured at sea, presented by Capt. Morgan; an Alexandrine Parakeet (*Palaornis alexandri*) from India, presented by Mr. Chas. Williams; a Black-eyebrowed Albatross (*Diomedea melanophrys*) from False Bay, South Africa, a Vulturine Eagle (*Aquila verreauxi*) from South Africa, a Sharp-headed Lizard (*Lacerta oxycephala*) from Madeira, presented by Mr. W. Ayshford Sandford, F.Z.S.; a Black-crested Eagle (*Lophoetus occipitalis*) from South Africa, presented by the Lady Robinson; a Rufescent Snake (*Leptodira rufescens*), a Hoary Snake (*Coronella canis*), a Keeled Euprepes (*Euprepes carinatus*), five Rough-scaled Zonures (*Zonurus corydus*) from South Africa, presented by the Rev. G. H. R. Fisk, C.M.Z.S.; three Grey-breasted Parakeets (*Bolborhynchus monachus*) from South America, a Pale-headed Broadtail (*Platycercus pallidiceps*) from North-East Australia, deposited; two Lesser Vasa Parakeets (*Coracopsis nigra*) from Madagascar, purchased.

ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, NOVEMBER 3-14

(For the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on November 8

Sun rises, 7h. 8m.; souths, 11h. 43m. 54*''*s.; sets, 16h. 20m.; decl. on meridian, $16^{\circ} 43' S.$; Sidereal Time at Sunset, 19h. 32m.

Moon (two days after New) rises, 8h. 28m.; souths, 13h. 9m.; sets, 17h. 46m.; decl. on meridian, $16^{\circ} 33' S.$

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian
Mercury ...	8 34 ...	12 38 ...	16 42 ...	$21^{\circ} 42' S.$
Venus ...	11 22 ...	14 54 ...	18 26 ...	$26 12 S.$
Mars ...	23 48* ...	7 0 ...	14 12 ...	$13 11 N.$
Jupiter ...	2 34 ...	8 46 ...	14 58 ...	$1 33 N.$
Saturn ...	19 17* ...	3 25 ...	11 33 ...	$22 18 N.$

* Indicates that the rising is that of the preceding day.

Phenomena of Jupiter's Satellites

Nov.	h. m.	Nov.	h. m.
8 ...	4 54 II. ecl. disap.	13 ...	4 59 I. tr. ing.
9 ...	5 40 III. occ. reap.	13 ...	7 16 I. tr. egr.
10 ...	4 42 II. tr. egr.	14 ...	4 37 I. occ. reap.
12 ...	6 54 I. ecl. disap.		

The Phenomena of Jupiter's Satellites are such as are visible at Greenwich.

Nov.	h.	
10 ...	20 ...	Venus in conjunction with and $7^{\circ} 49'$ south of the Moon.

OPTICAL THEORIES¹

THE last general report on Optics which was laid before the Association was read at Dublin by the late Dr. Lloyd in the year 1834, fifty-one years ago. Since then, in 1862, Prof. Stokes dealt very completely with double refraction so far as the elastic-solid theory is concerned, and there is little to add to what he said then. In all branches of his subject the fifty-one years since Dr. Lloyd's report have been most fruitful, and in consequence the mass of papers to be dealt with has been very large.

The report is divided into four sections: the first, which is introductory, deals with the work of Green, MacCullagh, Cauchy, and Neumann, the founders of the elastic-solid theory.

In the second section the more modern writers on the elastic-

¹ Report presented to the British Association by R. T. Glazebrook, M.A. F.R.S.